UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P O Box 1450
Alexandria, Virginia 22313-1450
www uspto gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,751	10/29/2003	John Frederick Porter	D1815-00138	7560

8933 7590 11/28/2008
DUANE MORRIS LLP - Philadelphia
IP DEPARTMENT
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103-4196

EXAMINER	
MAKI, STEVEN D	

ART UNIT	PAPER NUMBER
1791	

MAIL DATE	DELIVERY MODE
11/28/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/696,751
Filing Date: October 29, 2003
Appellant(s): PORTER, JOHN FREDERICK

Gerald K. Kita
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 9-18-08 appealing from the Office action mailed 4-16-08.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

This application 10/696,751 (filed 10-29-03) is a division of parent application 10/155,650 (filed 5-23-02), which is division of grandparent application 09/478,129 (filed 1-5-00). In grandparent application 09/478,129, a decision by the Board of Patent Appeals and Interferences affirming a 103 prior art rejection over Newman et al (6,054,205) in view of Kennedy et al (US 5,308,692) was rendered 3-9-04.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct. The request for reconsideration of the final rejection filed 6-16-08 did not present amendments to the claims.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,054,205	NEWMAN ET AL	04-2000 (filed 05-1997)
6,187,409	MATHIEU	02-2001 (filed 03-1998)
4,450,022	GALER	05-1984
CA 2,006,149	CANADA	06-1991
6,176,920	MURPHY ET AL	01-2001 (filed 06-1998)
6,001,935	PALMER	12-1999
6,254,817	COOPER ET AL	07-2001 (filed 12-1998)
4,617,219	SCHUPACK	10-1986

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 17-18, 22-23, 26-28, 30-32 and 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Newman et al (US 6,054,205) in view of Mathieu

(US 6,187,409), Galer (US 4,450,022), Canada (CA 2006149), Murphy et` al (US 6,176,920) and Palmer (US 6,001,935).[1]

Newman et al, directed to making SMOOTH reinforced cementitious boards, discloses providing a **facing sheet comprising an <u>open mesh glass scrim</u> and a <u>polymer web</u> such as a meltblown web** (col. 2 lines 21-40). The open mesh scrim 15 comprises transverse yarns 25 and longitudinal yarns 30 bonded together at their cross over points 35 wherein the yarn comprises glass filaments coated by an alkali and moisture resistant thermoplastic polymer coating such as polyvinyl chloride or thermosetting polymer coating such as epoxy (col. 5 lines 33-67). The open mesh scrim 15 has mesh openings 40 (col. 5 lines 23-25). The meltblown web comprises thermoplastic fibers such as polypropylene fibers (col. 6 lines 1-45). The basis weight of the melt blown polymer web 20 is between about 1 and 100 g/m^2 (col. 6 lines 42-45). The melt blown web is typically thin (col. 2 lines 43-44). The melt blown web is a porous web which partially and uniformly covers the mesh openings (col. 6 lines 10-13). Newman et al teaches joining the meltblown web to the open mesh scrim and prefers directly forming the meltblown web on the open mesh scrim such that the meltblown web adheres (unites) to the open mesh scrim (col. 2 lines 30-34, col. 3 lines 16-23, col. 6 lines 1-3). Newman et al discloses making a SMOOTH cement board by depositing a first cementitious slurry 76 formed of a composition comprising cement on the <u>facing sheet 72 (e.g. facing sheet comprising the open mesh scrim and meltblown web)</u>;

---

[1] It is noted that the correct patent number for Galer is "4,450,022" instead of "4,450,002". See PTO 892 attached to the non-final office action dated 5-3-06.

optionally depositing a second higher viscosity cementitious slurry 93 on the deposited layer of the first cementitious slurry 76; *optionally* depositing a low viscosity third slurry 91 on a facing sheet 10 comprising the open mesh scrim and meltblown web supplied from roll 70; applying the facing sheet 10 onto the first cementitious slurry 76 (and optionally cementitious slurry 93) such that the exposed three dimensional grid profile surface 55 on the lower face of the facing sheet 10 directly contacts the cementitious slurry(s); applying pressure with pressing rolls 80 such that facing sheet 10 is pressed into "the cementitious slurry 76 or slurries" ("76" or "76 and 93" or "76 and 91" or "76, 93 and 91"), the cementitious slurry is forced up through the mesh openings 40 of the facing sheet 10, the meltblown web (nonwoven web) 20 of the facing sheet 10 maintains a portion of the cementitious slurry 76 on the surface of the glass fiber facing sheet 10 and causes the slurry to window pane the mesh openings 40 of the glass scrim 15 thereby forming a substantially planar bridge surface between the transverse and longitudinal yarns 25 and 30 and mechanically integrating the facing sheet 10 into the cement board 12; and hydrating the cementitious material to harden the cementitious slurry 76 or slurries. The first cementitious slurry 76 has a lower viscosity than the higher viscosity optional second cementitious slurry 93. See abstract, figure 6, figure 8, col. 2 lines 13-14, 37-40, 61-63, col. 3 lines 16-67, col. 6 lines 48-59, col. 9 lines 1-67, col. 10 lines 1-37, col. 12 lines 4-17, col. 12 lines 26-30. At col. 2 lines 43-49, Newman et al describes the mechanical interaction of the scrim and the slurry and is silent as to interaction between the melt blown web and the slurry. At col. 3 lines 35-36, Newman et al states: "... allowing the cementitious slurry layer to harden to form the

engineered surface." At col. 10 lines 4-8, Newman et al states: "Preferably the cementitious slurry 76 substantially fully surrounds the cross-section of the longitudinal and transverse yarns 25 and 30 to achieve a high level of mechanical integration of the facing sheet 10 into the core when the slurry hardens." At col. 6 lines 1-3, Newman et al also teaches "A melt blown polymer web 20 is preferably joined to the glass scrim 15 on one face 45 of the scrim, but may be applied on both faces of the scrim." (emphasis added). When the melt blown web is applied on both faces the scrim, pressing the glass fiber facing sheet must extend the slurry through the openings in the lower melt blown web to reach the scrim and integrate mechanically with the scrim. Col. 6 lines 1-3 reveals that Newman et al disclosed and contemplated a melt blown web having openings sufficient in size to allow cementitious slurry to extend completely there through.

The following additional discussion of Newman et al is included to clarify the record: Newman et al teaches manufacturing a cement board using a single cementitious slurry (76). The second cementitious slurry (93) in Newman et al is optional. See col. 3 lines 45-47. The additional cementitious slurry (91) in Newman et al is optional. See col. 3 lines 51-53. Figure 6 illustrates the first slurry 76, the second slurry 93 and the third slurry 91. However, a fair reading of the entirety of Newman et al reveals that cementitious slurry 76 may be used without slurries 93 and 91. Attention is directed to Newman et al's use of the term "optionally" (both occurrences) at col. 3 lines 45-53. Attention is also directed to the description of "the cementitious slurry 76 or slurries" at col. 9 line 40. When slurry 91 is not used, the cementitious slurry 76 is

forced up through the mesh openings of the facing sheet and must extend at least partially through the melt blown web. This action of forcing up and extending at least partially through the nonwoven web comprising meltblown fibers must occur because Newman et al's invention is to use the meltblown web to prevent the slurry from sinking back down and forming meniscuses. If the slurry 76 remains below the melt blown web and the slurry 91 is not used, then the melt blown web cannot prevent the slurry 76 from sinking back down. It is acknowledged that Newman et al teaches melting the fibers of the melt blown web to form a microporous layer. This a mutually exclusive embodiment because Newman et al teaches using a basis weight of 2-30 g/m^2 in the embodiment in which the fibers are not melted whereas a basis weight of 45-75 g/m^2 is used for the melt blown web in the embodiment in which the fibers are melted to form the microporous layer. With respect to the facings, Newman et al teaches that a facing sheet comprising a mesh and a meltblown web may be used for both the first facing sheet (10) and the second facing sheet (72). See abstract, col. 2 lines 53-57, col. 9 lines 4-11 of Newman et al.

Figure 6 of Newman et al fails to show the location of the facing sheets in the cement board. On the other hand, **Figure 8** shows a cross section of the cement board and identifies a surface portion 86 of the cementitious core 80 and a surface portion 90 of the cementitious core 80. As can be seen from figure 8, the scrim 15 and melt blown web 20 are illustrated as being located in the surface portion 86 of the core instead of the surface of the cement board. Figure 8 illustrates the warp yarn and weft yarn of the scrim 15. Figure 8 further illustrates that the melt blown web 20 is on top of the scrim

15. During evaluation of Figure 8, it is important to appreciate that the melt blown web 20 in Newman et al is a thin porous web having a basis weight as low as 1 gram per square meter. See Newman et al at col. 2 lines 43-44, col. 6 lines 10-13, and col. 6 lines 38-45. As can also be seen from figure 8, the facing sheet 72 is located in surface portion 90 of the cementitious core 80 instead of the surface of the cement board. The second facing sheet 72 may comprise a meltblown polymer web joined on one surface of a scrim (col. 2 lines 53-57). In the specification, Newman et al states: "As shown in FIG. 8, the glass fiber facing sheet 10 comprising the glass scrim 15 and the melt blown web 20 is mechanically integrated into a surface portion 86 of the cementitious core 80 forming the cement board. In addition, the facing sheet 72 is mechanically integrated into an opposing surface portion of the cementitious core 80."

The use of a single slurry 76 is consistent with the formation of a smooth cementitious board having a cement skin adjacent an outer face. In any event: As to claims 17 and 18, it would have been obvious to one of ordinary skill in the art to penetrate the facing sheet 72 and/or the facing sheet 10 in the cementitious slurry in Newman et al's process of making a smooth cementitious board such that the facing sheet is embedded in cementitious material and a cement skin is formed since

(1) Newman et al, directed to making a smooth cement board having reinforcing facing sheet(s) each comprising a open mesh scrim and a meltblown web, teaches that the meltblown web of the facing sheet maintains a portion of the cementitious slurry 76 on the surface of the glass fiber facing sheet 10 and causes the slurry to window pane the mesh openings 40 of the glass scrim 15 thereby mechanically integrating the facing

sheet into the cement board and forming a substantially planar bridge surface between the transverse and longitudinal yarns, (2) Mathieu, also directed to making a cement board having reinforcing sheets (e.g. mesh, scrim, nonwoven fabric) teaches embedding the reinforcement mesh in the cement such that the mesh is at or near the surface of the board so as to enhance the strength of the board (col. 13 lines 58-67, col. 14 lines 1-67, col. 15 lines 1-67, col. 16 lines 1-47, col. 1 lines 41-50, col. 6 lines 48-61, col. 16 lines 29-47, col. 17 lines 55-65) and (3) Galer, also directed to making a cement board having reinforcing sheets (woven mesh, scrim, nonwoven), suggests submeging the reinforcement just below one or both of the surfaces so that the mesh is covered by a smooth, continuous, uniformly thin layer of cementitious material and is properly anchored in the panel. Mathieu, which is directed to making the same type of cement board as Newman et al, provides ample suggestion to perform Newman et al's process of making a cement board such that the reinforcing facing sheet 10 is <u>completely embedded</u> in the cement immediately beneath the surface ("cement skin") of the cement panel and so that the panel has enhanced strength (col. 1 lines 41-50, col. 17 lines 55-65). Galer, which is directed to the same type of cement board as Newman et al, motivates one of ordinary skill in the art to <u>completely embed</u> the reinforcing sheet 10 such that a cement skin is formed so that the reinforcing sheet is properly anchored and the desired smooth surface is formed (col. 1 lines 5-11, col. 1 lines 35-41, col. 2 lines 35-47). It is noted that Newman et al teaches and contemplates <u>completely embedding</u> a meltblown web in the cement because Newman et al teaches that the meltblown polymer web may be applied to both faces of the glass scrim 15 (col. 6 lines 1-3).

With respect to penetrating and forming a cement skin, the applied prior art to Mathieu and Galer provide ample suggestion / motivation to penetrate the facing sheet 10 and/or the facing sheet 72 so as to form a cement skin as claimed. Mathieu's teaches that submerging a mesh from about 0.5-2.0 mm below the surface of the board is an alternative to the mesh being at the surface of the board (col. 17 lines 55-65, col. 1 lines 41-50). Galer teaches that submerging a mesh just below the surface of the board allows one of ordinary skill in the art to obtain a smooth surface. This teaching in Galer to submerge a mesh just below the surface (form a "cement skin" covering the mesh) is highly relevant to Newman et al since Newman desires a smooth cementitious board and teaches away from a cementitious board which has pitting / indentations. Forming a cement skin so that the cement board has a "smooth surface" is consistent with Newman et al's disclosure to make a cement board having a "smooth surface". With respect to forming a cement skin, the applied prior art satisfies the TSM test approved by the Supreme Court in KSR.

Newman et al does not recite promoting penetration using a hydrophilic coating on the melt blown fibers of the non-woven web 20.

Canada, also directed to making a cement board having reinforcing sheets, discloses a process of manufacturing a cement panel comprising:

arranging a **surface reinforcing layer (14)** on a surface of a forming apparatus / mold 20;

spraying an inner surface 24 of the reinforcing layer 14 with a <u>suitable polymer (e.g. acrylic resin)</u>;

> casting **cementitious material (32)** on the coated reinforcing layer 14 and vibrating the apparatus to facilitate *penetration* of the cementitious material into the coated reinforcing layer 14;
>
> spraying a **surface reinforcing layer (16, 36)** with a <u>suitable polymer (e.g. acrylic resin)</u>;
>
> placing the coated reinforcing layer 36 over the cementitious material 32 and pushing the coated reinforcing layer 36 into the cementitious material 32 to facilitate *penetration* of the composition into the coated reinforcing layer 36; and
>
> curing the cement panel wherein the manufactured cement panel comprises a surface reinforcing layer on each side of a cementitious core 12.

Canada teaches that the surface reinforcing layer may be a porous fabric or paper. Canada teaches that the fabric should be composed of an alkaline resistant material (e.g. alkali resistant polymer fibers or glass fibers coated with a polymer) so it will not be damaged and eventually destroyed by the alkaline in the cementitious composition. Canada teaches that the fabric may be a random fiber fabric ("nonwoven fabric"). As an example of a fabric, Canada discloses suggests using a mat ("nonwoven fabric") of glass fibers coated with polymer during the manufacture of the mat. With respect to spraying the suitable polymer such as acrylic resin, Canada teaches:

> This polymer coating, which preferably is in addition to a polymer coating applied to the glass fiber during the manufacture of the mat, provides additional protection for the fibers of the reinforcing layer and results in a stronger bond between the central core 12 and fabric layer. One reason for the stronger bond is that the liquid polymer coating will decrease the viscosity of the cementitious composition when it is poured into the form and this in turn permits the composition to penetrate the fabric or paper layers. (pages 13-14).

<u>The sprayed polymer (e.g. sprayed acrylic resin) functions, therefore, as a wetting agent and enhances adhesion of fabric to an alkali cementitious matrix</u>. In figures 3-8, Canada shows a process of making a cement panel comprising a single fabric layer 14

and a single fabric layer 16. Canada additionally teaches "... instead of a single layer of surface-reinforcing fabric or paper on each major surface of the product, several layers of such material placed one over another can be used with the layers being adhered together by the cementitious composition and/or polymer coatings" (page 18).

Murphy et al teaches that the strength of reinforcing material which is used to improve the strength of a panel can be destroyed over time because of the alkaline nature of cement. Alkaline resistant coatings may be applied to the reinforcing material but these coating are not always resistant to microbiological degradation and moreover, may not always be effective, as the degradation of the reinforcing material results from the presence of water. Murphy et al discloses providing scrim (porous reinforcing material fiberglass mesh coated with PVC to protect it against the effects of alkaline environment), placing a bottom scrim 46 into a mold 15, depositing wet cementitious mixture from hopper 55 on the bottom scrim 46, coating a top scrim 96 with water, placing the top scrim 96 coated with water on said wet cementitious mixture and using screeding and tamping apparatus 90 and 95 to embed the top scrim 96 and bottom scrim 46 in said wet cementitious mixture. Scrim embedment for both the top scrim 96 and bottom scrim 46 is approximately 1/16 of an inch (1.6 mm). See figure 5. The top scrim 96 coated with water reduces the surface tension of the cementitious material. By reducing the surface tension, the embedment of the top scrim 96 into the cementitious mixture is facilitated during the screeding and tamping steps. See col. 5 lines 32-39. After hardening, the cementitious panel 120 (figure 5), can be treated with a waterproof coating 151, 152.

With respect to promoting penetration, it would have been obvious to one of ordinary skill in the art to apply a hydrophilic material as claimed to the fibers of the mesh and melt blown web (non-woven web) in Newman et al's process when completely embedding and forming a cement skin as suggested by Mathieu and Galer since (1) Canada suggests spraying suitable polymer such as acrylic resin to facilitate penetration of cementitious material (i.e. cement) into fabrics, (2) Murphy et al suggests coating a scrim with water to reduce surface tension of the cementitious material and thereby facilitate complete embedment of the scrim 96 into the cementitious material (figure 5, col. 5 lines 20-39) and (3) Palmer teaches imparting a hydrophilic coating to fibers of woven or non-woven fabric made of polymer such as polypropylene where it is desirable to make the surface of the fiber more hydrophilic for better or easier incorporation into a water-borne composition such as a cement slurry (abstract, col. 1 lines 5-23, col. 8 lines 58-64 and col. 10 lines 8-10).

Hence, Newman discloses that the cement board should have a SMOOTH surface. The secondary art to Mathieu and Galer provide ample suggestion and motivation to completely embed Newman et al's facing sheet just below the surface of the cement board so as to form the claimed "cement skin" with the expected benefits of obtaining proper anchoring, enhanced strength and a SMOOTH surface. When incorporating fibrous material into cementitious material, the applied prior art to Canada, Murphy and Palmer suggest / motivate one of ordinary skill in the art to form a "hydrophilic coating" on the fibers of the mesh 15 and non-woven web 20 of the facing sheet of Newman et al to facilitate penetration of the cementitious material through the

fibers of the facing sheet so as to embed the sheet in a surface portion of the core so as to be spaced from the board surface by a cement skin. With respect to the hydrophilic coating, the applied prior art satisfies the TSM test approved by the Supreme Court in KSR.

As to claims 22 and 23, Newman et al suggests using polypropylene fibers for the meltblown polymer web.

As to claim 26, the claimed heat fusing step reads on the step of adhering the meltblown fibers to the open mesh as disclosed by Newman et al.

As to claims 27-28, 30-32 and 34-35: Newman et al teaches adhering the yarns of the open mesh scrim together using polymer binder (adhesive). Canada, Murphy et al and Palmer suggest coating the mesh and nonwoven of Newman et al with "hydrophilic compound" to facilitate the complete embedding of the facing in the cement. Palmer et al additionally suggests using wetting agents and surfactants. Newman et al teaches compacting with pressing rolls 80. Newman et al suggests using polypropylene fibers for the meltblown polymer web.

Claims 21 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Newman et al (US 6,054,205) in view of Mathieu (US 6,187,409), Galer (US 4,450,022), Canada (CA 2006149), Murphy et al (US 6,176,920) and Palmer (US 6,001,935) as applied above and further in view of Cooper (US 6,254,817).

As to claims 21 and 37, it would have been obvious to one of ordinary skill in the art to art to form sheathed glass fibers using the claimed steps of wrapping glass fibers with fibers of alkali resistant material and heating in view of (1) Newman et al's teaching

that the glass fibers should be encapsulated by alkali resistant polymer such as thermoplastic material to prevent chemical interaction between the glass fibers and cementitious material and (2) Cooper et al's suggestion to form alkali resistant sheathed fibers for a mesh of a cement board by using the steps of wrapping glass fibers with thermoplastic (fibers of alkali resistant material) and heating.

Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Newman et al (US 6,054,205) in view of Mathieu (US 6,187,409), Galer (US 4,450,022), Canada (CA 2006149), Murphy et al (US 6,176,920) and Palmer (US 6,001,935) as applied above and further in view of Schupack (US 4,617219).

As to claims 24-25, it would have been obvious to use a spunbonded web instead of a meltblown web as the nonwoven polymer web since Schupack, also directed to making a cement board having reinforcing sheets therein, suggests using a polypropylene spunbonded as a nonwoven web to be embedded in the cement material.

As to claim 26, it would have been obvious to one of ordinary skill in the art to heat fuse the mesh and nonwoven web (meltblown web or spunbonded web) to adhere (unite) the mesh and nonwoven web together since Schupack also teaches bonding a nonwoven to a scrim for example by melt bonding.

(10) Response to Argument

Claim 17 describes a method of making "smooth cementitious board". Newman et al teaches a method of making a cementitious board having a "smooth surface".

Claim 17 requires a reinforcement fabric comprising an open mesh united with a thin porous nonwoven web. Newman et al discloses the reinforcement fabric as set forth in step (a) of claim 17. There is no difference between (1) the claimed reinforcement fabric comprising an open mesh united with a thin porous nonwoven web as set forth in step (a) of claim 17 and (2) Newman et al's disclosed glass fiber facing sheet 10 comprising a thin porous melt blown polymer web 20 joined to an open mesh glass scrim 15. The same fibrous material is being described.

Claim 17 requires a cement skin. Newman et al teaches making a smooth cementitious board comprising a nonwoven joined to a scrim. There is no literal antecedent basis for "cement skin" in Newman et al.[2] However, Mathieu and Galer teach making cement board comprising a nonwoven or a scrim and having a cement skin. There is no difference between (1) the claimed cement skin in claim 17 and (2) the cement skin disclosed by Mathieu and Galer. The same cement skin is being described. Galer teaches that the cement skin forms a smooth surface as desired by Newman et al. The way Mathieu and Galer form a cement skin is the same as appellant's way - completely penetrating and submerging fibrous material in the cementitious material.

When incorporating fibrous material (e.g. scrim or nonwoven) in cementitious material, the applied prior art to Canada, Murphy et al and Palmer teach applying

[2] On page 5 of the Final Office Action dated 4-16-08, examiner stated: "The use of a single slurry 76 is consistent with the formation of a smooth cement board having a cement skin adjacent to an outer face". This observation by the examiner is reflective of the fact that appellant cannot prove that Newman et al fails to form a cement skin when using only slurry 76. The mere fact that result of failure to form a cement skin when using slurry 76 alone is possible is not sufficient.

material (e.g. hydrophilic material) to fibrous material to facilitate incorporation of the fibrous material in cementitious material. This is true when the fibrous material is to be completely embedded in the cementitious material (Murphy). This is also true when the fibrous material is to be only partially embedded in the cementitious material (Canada).

Appellant argues that the claimed method of promoting penetration through and forming a cement skin does not reasonably encompass the glass fiber facing sheet 10 that provides the exterior surface of the cement board 12 in Newman et al (page 4 of Brief filed 9-18-08). This argument is not persuasive. FIRST: Newman et al fails to contain any express teaching that the smooth cement board must not have a cement skin.[3] SECOND: Newman et al fails to teach that a "fibrous surface" is formed when the melt blown web has the lower basis weight such as 2 g/m^2. THIRD: Cementitious slurry 76 must penetrate the mesh openings 40 of the scrim 15 and must at least partially penetrate the openings of the porous thin melt blown polymer web 20 when slurry 91 is not used because Newman et al explains that "... the melt blown polymer web 20 prevents the cementitious slurry 76 from sinking into the large mesh openings 40 of the glass fiber facing sheet 10" (col. 9 lines 49-51). If slurry 76 and the melt blown fiber web 20 do not contact (appellant's apparent position), it would be impossible for the melt blown web to prevent the slurry from sinking. FOURTH: Mathieu and Galer

[3] Indeed, appellant has admitted that a "cement skin" is formed in Newman et al when slurry 91 is used. In particular, appellant has made the following statements: (1) "... there is no description anywhere in the reference of a cement skin feature by using the slurry 76 without the slurry 91." (page 4 of after final response filed 6-18-08); (2) "The disclosure in Newman for making a cement skin appears at column 9, lines 30-35..." (page 12 of response filed 12-12-07); (3) "The third slurry 91 of Newman et al. differs, since the third slurry 91 stays on top of the web to form a skin, and does not penetrate through the web." (page 2 of response filed 9-4-07); and (4) "In Newman et al., slurry 91 forms a cement skin by being added onto a top surface of a meltblown polymer web 20." (page 9 of response filed 8-14-07).

provide ample suggestion and motivation to completely embed Newman et al's facing sheet just below the surface of the cement board so as to form the claimed "cement skin" with the expected benefits of obtaining proper anchoring, enhanced strength and a SMOOTH surface. FIFTH: When incorporating fibrous material into cementitious material, the applied prior art to Canada, Murphy and Palmer suggest / motivate one of ordinary skill in the art to form a "hydrophilic coating" on the fibers of the mesh 15 and non-woven web 20 of the facing sheet of Newman et al to facilitate penetration of the cementitious material through the fibers of the facing sheet so as to embed the sheet in a surface portion of the core.

With respect to Newman et al, appellant mentions slurry 76 and slurry 91 (e.g. pages 4 and 5 of Brief filed 9-18-08). However, appellant's understanding of the scope and content of Newman et al is incomplete and inaccurate. In Newman et al, the cement board may be made using the glass fiber facing sheet and *only first cementitious slurry 76*.[4] When first cementitious slurry is used by itself, the first cementitious slurry is deposited on a first facing sheet and a glass fiber facing sheet is disposed on the deposited cementitious slurry. The glass fiber facing sheet comprises a melt blown fiber web and an open glass fiber facing scrim. The scrim has mesh openings. The melt blown fiber web, which partially covers the mesh openings of the

---

[4] Prior to the filing of the Appeal Brief, appellant disagreed with this factual finding. See after final response filed 6-18-08 and Advisory Action dated 7-25-08. It is interesting to observe that appellant's statements that "the slurry 91 is not disclosed as optional" (page 2 of after final response filed 6-16-08) and "In Newman et al., slurry 91 forms a cement skin by being added onto a top surface of a meltblown polymer web 20." (page 9 of response filed 8-14-07)" are <u>inconsistent with</u> appellant's statement that "There should be a fibrous surface in Fig. 8, like the fibrous surface shown in Fig.7" (page 6 of Brief filed 9-18-08).

scrim, is a thin porous web having openings. The glass fiber facing sheet is mechanically integrated into a surface portion of the cement board along the exposed surface of the scrim. During mechanical integration, the glass fiber facing sheet is pressed into the cementitious slurry so that the cementitious slurry is forced up through the mesh openings of the scrim of the glass fiber facing sheet.[5] The force of gravity then causes the cementitious slurry to sink back down away from the glass fiber facing sheet and form meniscuses within the mesh openings of the scrim. If the meniscuses are permitted to form, pitting or the formation of indentations may occur in the mesh openings. Newman et al prevents the undesirable formation of pitting or indentations and obtains a smooth cement board by using the melt blown fiber web. In particular, the **melt blown fiber web** prevents the cementitious slurry from sinking away from the glass fiber facing sheet (scrim 15 and melt blown fiber web 20). The **melt blown web fiber web** maintains a portion of the cementitious slurry *on the surface of* the glass fiber facing sheet 10 (scrim 15 and melt blown fiber web 20). The **melt blown fiber web** causes the slurry to window pane *over* the mesh openings *on the exterior of* the scrim of the glass fiber facing sheet 10 (scrim 15 and melt blown fiber web 20). The **melt blown fiber web** thereby forms a substantially planar bridge surface between transverse and longitudinal yarns of the scrim of the glass fiber facing sheet. In order for the meltblown fiber web to function as described above, the cementitious slurry must contact and at least partially penetrate **the melt blown fiber web**. Appellant fails to acknowledge that,

[5]Appellant omits discussion of Newman et al's teaching to press the glass fiber facing sheet 10 (scrim 15 and melt blown fiber 20) into cementitious slurry 76. The penetration of the cementitious slurry into the melt blown fiber web occurs during the pressing step.

when only cementitious slurry 76 is used, the cementitious slurry 76 *must contact* the melt blown web 20. This is not a possibility. It is a certainty.

Appellant comments that Newman et al states: "... the glass fiber facing sheet 10 of the present invention provides a provides a smooth cement board 12 which is essentially free of pitting" (page 4 of Brief filed 6-18-08 quoting Newman et al at column 10 lines 19-21).[6] Examiner agrees that Newman et al desires a "smooth cement board". Examiner adds that the glass fiber facing sheet 10 of Newman et al enables the board to have a smooth surface because the melt blown polymer web 20 prevents the cementitious slurry 76 from sinking into the large mesh openings 40 of the glass fiber facing sheet 10 and maintains a portion of the cementitious slurry 76 on the surface of the glass fiber facing sheet 10 (Newman et al at col. 9 lines 49-54).

Appellant argues that "cement skin" contradicts Newman et al's disclosure of "the melt blown web provides a substantially smooth exterior surface to said cement board". Appellant is incorrect. Appellant incorrectly interprets "melt blown web providing a substantially smooth exterior surface" as meaning --cement board has a fibrous surface--. Appellant's interpretation contradicts (1) Newman et al's description of the problem to be solved (col. 2 lines 1-7) and Newman et al's description of the solution (col. 9 lines 43-61); (2) Newman et al's disclosure of the optional embodiment of coating the upper surface of glass fiber facing sheet 10 comprising the melt blown web 20 and scrim 15 with cementitious slurry 91 (col. 3 lines 51-53, col. 9 lines 30,31); (3) Newman

[6] This statement in Newman et al is similar to the following statement from appellant's abstract: "The reinforcement also enables the boards to have smooth outer faces suitable for painting, papering, tiling or other finishing treatment".

et al's description of "... allowing the cementitious slurry layer to harden to form the engineered surface" (col. 3 lines 35-36); (4) Newman et al's teaching that the melt blown web may have a basis weight as low as 1 g/m^2; and (5) Figure 8.

Appellant argues that Newman et al's board has a "fibrous surface" (page 5 and page 6 of Brief filed 9-18-08). Examiner disagrees. Newman et al fails to teach that the board has a "fibrous surface". Description of "fibrous surface" is nowhere to be found in Newman et al.

Appellant argues "Fig. 7 is drawn with a fibrous surface ..." (page 5 of Brief filed 9-18-08). Appellant is incorrect. One of ordinary skill in the art cannot conclude surface characteristic from **Figure 7**. One of ordinary skill in the art would readily understand that the short dashed lines in Fig. 7, which are similar to those found in Figure 3, indicate that a scrim is submerged below the surface of the board. See Figure 8 (which is a cross section of Figure 7).

Appellant argues that discrepancies in Figure 8 compared with the specification amount to an unreliable source and that there should be a "fibrous surface" in Figure 8 (pages 5, 6 and 7 of Brief filed 9-18-08). This argument is not persuasive. **Figure 8** correctly illustrates the warp yarn and weft yarn of the scrim 15 and illustrates the melt blown web 20 as being on top of the scrim 15. During evaluation of Figure 8, it is important to appreciate that <u>the melt blown web 20 in Newman et al is a thin porous web having a basis weight as low as 1 gram per square meter</u>. See Newman et al at col. 2 lines 43-44, col. 6 lines 10-13, and col. 6 lines 38-45.

With respect to the upper facing sheet 10, appellant acknowledges that Figure 8 of Newman et al might suggest the scrim 15 and the web 20 are below the surface of the cement board (page 5 of Brief filed 9-18-08). With respect to *upper facing sheet 10*, examiner emphasizes that the cementitious slurry 76 is forced up through the mesh openings of the facing sheet and must extend at least partially through the melt blown web when the optional slurry 91 is not used. This action of forcing up and extending at least partially through the nonwoven web comprising meltblown fibers must occur because Newman et al's invention is to use the meltblown web to prevent the slurry from sinking back down and forming meniscuses. If the slurry 76 remains below the melt blown web and the slurry 91 is not used, then the melt blown web cannot prevent the slurry 76 from sinking back down. This function of preventing the slurry from sinking back down is the reason why the meltblown web provides a substantially smooth exterior surface to the cement board.

With respect to a <u>first alleged discrepancy in Figure 8</u>, appellant asserts that Figure 8 depicts the scrim 15 on top of the meltblown polymer web 20 (pages 5, 6 of Brief filed 9-18-08). Appellant is incorrect. Figure 8 of Newman et al correctly illustrates the warp yarn and weft yarn of the scrim 15 and indicates the location of the thinner melt blown web 20 as being on the top surface of the scrim 15. The leader line for "20" is above the scrim 15 instead of below the scrim 15.

With respect to a <u>second alleged discrepancy in Figure 8</u>, appellant asserts that Figure 8 depicts the scrim 15 in cross-section as being one yarn (page 6 of Brief filed

9-18-08). Appellant is incorrect. Figure 8 of Newman et al correctly illustrates scrim 15 as comprising warp yarn and weft yarn. Appellant's apparent position that the scrim is one yarn is unreasonable in light of Newman et al's unambiguous disclosure that the scrim comprises transverse (weft) yarns and longitudinal (warp) yarns.

With respect to a third alleged discrepancy in Figure 8, appellant asserts that the specification teach that the glass fiber facing sheet 10 not slurry 76 provides the smooth surface (page 6 of Brief filed 9-18-08). Appellant is incorrect. Contrary to appellant's argument, Newman et al fails to teach that "the glass fiber facing sheet 10 not slurry 76 provides a smooth exterior surface of a cement board". Appellant incorrectly interprets "glass fiber facing sheet provides a smooth surface" as meaning --the cement board has a fibrous surface-- in view (1) Newman et al's description of the problem to be solved (col. 2 lines 1-7) and Newman et al's description of the solution (col. 9 lines 43-61); (2) Newman et al's disclosure of the optional embodiment of coating the upper surface of glass fiber facing sheet 10 comprising the melt blown web 20 and scrim 15 using a low viscosity cementitious slurry 91 (col. 3 lines 51-53, col. 9 lines 30,31); (3) Newman et al's description of "... allowing the cementitious slurry layer to harden to form the engineered surface" (col. 3 lines 35-36); (4) Newman et al's teaching that the melt blown web may have a basis weight as low as 1 g/m^2; and (5) Figure 8.

With respect to the lower facing sheet, appellant acknowledges that Figure 8 of Newman et al might suggest a cement skin covering the facing sheet 72 and formed by the slurry 76 (page 6 and page 7 of Brief filed 9-18-08). With respect to *lower facing*

sheet 72, Newman et al teaches "... depositing a first cementitious slurry onto and through the facing sheet ..." (col. 3 lines 44-45).

Appellant argues that the ordinary and plain meaning of the word "facing" in the term, glass fiber facing sheet means "cover" (page 4 of Brief filed 9-18-08). More properly, Newman et al teaches that "... the glass fiber facing sheet 10 comprising the glass scrim 15 and the melt blown web 20 is mechanically integrated into a surface portion 86 of the cementitious core 80 forming the cement board." (col. 10 lines 13-16). Furthermore, Figure 8 shows the glass fiber facing sheet (20, 15) as covering the cementitious core 80.

Appellant argues that Newman et al considered as a whole does not disclose a cement skin (page 7 of Brief filed 9-18-08). This argument is not persuasive. Newman et al's preferred embodiment of making a cement board is to use a glass fiber facing sheet 10 comprising a scrim 15 and a melt blown web 20 having the lower basis weight of 2-30 g/m^2 (Figure 1, col. 4 lines 5-8) and only first cementitious slurry 76 (col. 3 lines 37-61). Second cementitious slurry 93 is optional. The additional low viscosity cementitious slurry 91 is optional. When the glass fiber facing sheet is pressed into the cementitious slurry 76, contact and at least partial penetration of the openings of the thin porous melt blown fiber web necessarily occurs. This not a possibility. It is a certainty. Mathieu and Galer render obvious performing Newman et al's process such that Newman et al's facing sheet is embedded in cementitious material and a cement skin is formed. Lack of literal antecedent basis in Newman et al for "cement skin" and any remote possibility that a "cement skin" is not formed when using slurry 76 is

insufficient to establish a factual finding that Newman et al teaches avoiding the formation of a cement skin.

Appellant argues that Mathieu discloses an individual scrim (page 7 of Brief filed 9-18-08). This argument is not persuasive. **Mathieu describes embedding a mesh in cementitious material at <u>or</u> beneath the surface of the board** (col. 17 lines 55-65). **Mathieu's mesh may be two or mats of different fibrous material, a non-woven web, scrim, etc.** (col. 15 lines 47-49, col. 1 lines 61-67, col. 2 lines 1-4, col. 13 lines 57-67, col. 14 lines 1-67, col. 15 lines 1-49). Mathieu describes completely embedding the mesh in the slurry (col. 6 lines 48-61). Mathieu describes embedding the fibers of the mesh just beneath the surface at a depth of submersion of about 0.5 mm to 2 mm (col. 17 lines 55-65). **When the mesh is completely embedded just beneath the surface of the board at a depth of 0.5 mm to 2 mm, a <u>cement skin</u> is formed.**[7] **As to types of meshes, Mathieu describes woven fabric, non-woven fabric and mat.** Appellant ignores Mathieu's disclosure at col. 17 lines 55-65.

With respect to Galer, appellant argues that the claimed step of promoting penetration does not reasonably encompass the method of using a riser 25 as disclosed in Galer (page 11 of Brief filed 9-18-08). This argument is not persuasive. **Galer obtains the <u>cement skin</u> by <u>penetrating</u> a scrim or nonwoven with cementitious material and submerging the scrim or nonwoven just below one or both of the faces. By covering the mesh with a cementitious mixture, the cement board is**

---

[7] Appellant states that the central plane of the fabric 18 should be imbedded to a depth of about 1/32 to 1/16 inch (page 1 of Brief filed 9-18-08). The depth of 1/32 to 1/16 inch is the same as 0.8 to 1.6 mm which substantially corresponds to Mathieu's range of 0.5 to 2.0 mm.

formed with a smooth surface. The scope and content of Newman et al and Galer includes the common goal of forming a cement board with a smooth surface. Also, claim 17 is generic to and reads on using a riser during the penetrating step.

Appellant notes that the mesh in Mathieu and the woven mesh or scrim or nonwoven pervious fabric in Galer has sufficiently large openings to be penetrated through by hydraulic cementitious material (page 8 of Brief filed 9-18-08). The same is true of appellant's reinforcement fabric. **Claim 17 describes the reinforcement fabric as comprising an "open" mesh and "porous" nonwoven web. Claim 17 requires "sufficiently large openings" because claim 17 excludes openings which are too small to permit penetration of the cementitious material.**

With respect to Murphy et al , appellant argues that "These scrims are layered between separate layers of cement that are successively applied layers." (page 8 of Brief filed 9-18-08). Appellant is incorrect. **Murphy applies cementitious material *only once* using hopper 55. Murphy promotes penetration of the top scrim 96 in the cementitious material by applying water ("hydrophilic material") on the top scrim 96 and pressing the top scrim coated with the water ("hydrophilic material") into the cementitious material using a screeding and tamping apparatus 90 such that the top scrim 96 is completely embedded in cementitious material as shown in figure 5.** Appellant ignores Murphy et al's teaching at col. 5 lines 32-39.

Appellant argues that Mathieu and Galer provide no reasonable expectation that the melt blown web (nonwoven) 20 of the facing sheet of Newman et al can be

embedded (page 9 of Brief filed 9-18-08). This argument is not persuasive. Each of Mathieu, Galer and Newman et al teach a porous nonwoven. Mathieu and Galer provide a reasonable expectation that Newman et al's porous meltblown nonwoven web can be embedded because Mathieu and Galer teach that a porous nonwoven can be embedded in cementitious material.

Appellant argues that US 5,405,533 to Altenhofer et al, which discloses a gypsum construction board having a fiberglass mat 4 and fiberglass nonwoven 5, teaches away from a cement skin (page 9 of Brief filed 9-18-08). This argument is not persuasive. First: US 5,405,533 to Altenhofer et al has not been relied upon in the prior art rejection. Second: Mathieu and Galer teach making a cement board having a cement skin wherein a fibrous material such as scrim or nonwoven is completely embedded in cementitious material.

Appellant argues that US 5,405,533 to Altenhofer et al, which discloses a gypsum construction board having a fiberglass mat 4 and fiberglass nonwoven 5, teaches away from completely penetrating slurry through a nonwoven layer and then concludes that Newman et al teaches away from completely penetrating slurry through a melt blown web (page 10 of Brief filed 9-18-08). This argument is not persuasive. First: US 5,405,533 to Altenhofer et al has not been relied upon in the prior art rejection. Second: Newman et al's teaching to apply meltblown web to both sides of the scrim (col. 6 lines 1-3) and encapsulate the scrim in cementitious material (col. 10 lines 1-18) reveals that Newman et al disclosed and contemplated a melt blown web having

openings sufficient in size to allow cementitious slurry to completely penetrate there through. Appellant ignores col. 6 lines 1-3 of Newman et al.

With respect to appellant's arguments regarding the use of hydrophilic material (pages 11-14 of Brief filed 9-18-08), Canada, Murphy et al and Palmer provide ample support for the finding of fact that one of ordinary skill in the art has the knowledge that application of a hydrophilic material to fibers provides the expected and predicted beneficial result of facilitating penetration / embedment in cementitious material. The desire to embed a fibrous sheet in cementitious material is found in Newman et al, Mathieu and Galer. The known benefit of completely embedding a fibrous sheet in cementitious material is a smooth surface as evidenced by Galer. It is undisputed that Newman et al wants a "smooth surface".

Appellant argues that Canada and Palmer do not teach a cement skin (pages 11-14 of Brief filed 9-18-08). This argument is off-point. Penetration of the glass fiber facing sheet by cementitious slurry is desired by Newman et al and complete penetration of a fiber sheet, whether it be woven or non-woven, by cementitious material is suggested by Mathieu and Galer. Furthermore, claim 17 recites "hydrophilic material" and each of Canada, Murphy et al and Palmer teach "hydrophilic material". Moreover, Canada, Murphy et al and Palmer recommend to one of ordinary skill in the cement art to use "hydrophilic material" on fibers whether in the form of a random fiber fabric (Canada), scrim (Murphy) or fabric or fiber (Palmer). Murphy recommends to one of ordinary skill in the cement art to use "hydrophilic material" when embedment of a

scrim is desired.[8] Canada recommends applying hydrophilic material to fibers of a fabric *even when* only partial penetration of the fabric by a cementitious slurry is desired. Palmer teaches applying hydrophilic material in applications where it is desirable to make the surface of the fiber more hydrophilic for better adhesion or easier incorporation into water borne compositions such as cement mixtures (col. 1 lines 5-23, col. 10 lines 8-11). Examiner maintains that, when penetration of a fiber sheet is desired as in Newman et al, Galer and Mathieu, it would have been obvious to apply hydrophilic material to such a sheet.

Appellant and examiner view Canada's wetting agent teaching differently. Appellant observes that the cementitious material does not penetrate through a fabric and form a cement skin even when a wetting agent is applied to the fabric (page 12 of Brief filed 9-18-08) whereas examiner observes that a wetting agent should be applied to a fabric even when cementitious material only partial penetrates the fabric.

Appellant refers to US 5,753,368 to Berke et al (page 14 of Brief filed 9-18-08). Berke et al, which teaches "Polyolefin fibers such as polypropylene, tend to be hydrophobic due to the nature of the material and require a wetting agent to provide a surface tension characteristic that allows them to become more easily dispersed within an aqueous concrete mixture" (col. 1 lines 16-20), is not relied upon in the rejection of the appealed claims. Burke et al is redundant to Palmer et al's teaching to apply hydrophilic material to fibers which are to be incorporated in cement mixtures.

---

[8] Murphy et al teaches forming a cement skin and appellant fails to argue otherwise.

As to claims 21 and 37, appellant's arguments regarding Cooper (page 15 of Brief 9-18-08) are not persuasive since Cooper provides ample suggestion to form Newman et al's yarns by using the steps of wrapping glass fibers with thermoplastic (fibers of alkali resistant material) and heating.

As to claims 24-26, appellant's arguments regarding Schupack (page 15 of Brief filed 9-18-08) are not persuasive since Schupack provides ample suggestion to use a spunbonded web as a nonwoven web and also provides ample suggestion to join (unite) by melt bonding.

(11) Related Proceeding(s) Appendix

Copies of the court or Board decision(s) identified in the Related Appeals and Interferences section of this examiner's answer are provided herein. See Appendix to Examiner's Answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Steven D. Maki/
Primary Examiner, Art Unit 1791
November 22, 2008

Conferees:

Yogendra Gupta
/Yogendra N Gupta/
Supervisory Patent Examiner, Art Unit 1791

/Christopher A. Fiorilla/
Chris Fiorilla
Supervisory Patent Examiner, Art Unit 1700